



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,031	07/06/2001	Mitsuyoshi Ichihashi	030662-075	3745

7590 10/15/2003

Platon N. Mandros
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, VA 22313-1404

EXAMINER

PEELY, MICHAEL J

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 10/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/899,031	Applicant(s) ICHIHASHI ET AL.	
	Examiner Michael J Feely	Art Unit 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

P **eriod for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 17 and 19-22 is/are rejected.
- 7) ☒ Claim(s) 1-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0103</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed January 21, 2003 fails to fully comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but not all of the information referred to therein has been considered.

The following foreign references were not submitted: EP 0 928 984; GB 1 455 442; and WO 00/04110. The following non-patent literature document was not submitted: EPO Search Report for EP application 01115725.2-2103.

Election/Restrictions

3. Applicant's election of Group I (claims 1-22) in Paper No. 0803 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

4. Claims 1-22 are objected to because of the following informalities:

Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative

Art Unit: 1712

expression, which is commonly referred to as a Markush group, recites members as being “selected from the group consisting of A, B and C.” See *Ex parte Markush*, 1925 C.D. 126 (Comm’r Pat. 1925). When materials recited in a claim are so related as to constitute a proper Markush group, they may be recited in the conventional manner, or alternatively. For example, if “wherein R is a material selected from the group consisting of A, B, C and D” is a proper limitation, then “wherein R is A, B, C or D” shall also be considered proper.

Claims 1 and 20 contain the following alternative expression: “in which Hb is a hydrophobic group **selected from the group consisting of** an aliphatic group having 4 to 40 carbon atoms, an aromatic group having 6 to 40 carbon atoms **or** an aliphatic substituted oligosiloxanoxy group having 1 to 40 carbon atoms”. This alternative limitation is not proper. Claims 2-19 are objected to because they depend from claim 1, and claims 21-22 are objected to because they depend from claim 20.

It should also be noted that page 3 (lines 3-7) of the Specification contains a proper alternative limitation for Hb.

Appropriate correction is required.

Claim Language Suggestions

5. Claim 7 limits the B1 group of formula (I) to an n-valent group represented by $(-Cy^1-L^2-)_nCy^2$, yielding an overall formula of: $(Hb-L^1-)_n(-Cy^1-L^2-)_nCy^2$. It is clear that each “Cy¹” would be bonded to a “L¹”, which would yield the following equivalent formula: $(Hb-L^1-Cy^1-L^2-)_nCy^2$. However, the presentation of the B1 limitation may appear to be unclear due to the reoccurrence of subscript “n”. The limitation of claim 7 would be more clearly

Art Unit: 1712

presented in terms of both B1 and the entire formula of the alignment promoter: wherein B1 is represented by $(-Cy^1-L^2-)_nCy^2$, yielding an overall formula of $(Hb-L^1-Cy^1-L^2-)_nCy^2$.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language;

or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. Claims 1-5, 17, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsuoka et al. (US Pat. No. 6,245,398)

The applied reference has a common assignee with the instant application; however, the inventive entity is different. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be

Art Unit: 1712

overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1-5, 17, and 19, Matsuoka et al. disclose (1) a liquid crystal composition comprising liquid crystal molecules and an alignment promoter (column 2, line 60 through column 4, line 14) represented the formula (I) in an amount of 0.01 to 20 wt.% based on the amount of the liquid crystal molecules (column 20, lines 58-62):



in which Hb is a hydrophobic group selected from the group consisting of an aliphatic group having 4 to 40 carbon atoms, an aromatic group having 6 to 40 carbon atoms, and an aliphatic substituted oligosiloxanoxy group having 1 to 40 carbon atoms; L^1 is a single bond or a divalent linking group; n is an integer of 2 to 12; and Bl is an n-valent group comprising at least two rings (Abstract; column 2, line 60 through column 4, line 14; column 17, line 1 through column 20, line 54); (2) wherein Hb is a fluorine-substituted alkyl group having 4 to 40 carbon atoms, an alkyl group having 6 to 40 carbon atoms, or a fluorine-substituted aryl group having 6 to 40 carbon atoms (column 3, lines 50-55); (3) wherein L^1 is a single bond or a divalent linking group selected from the group consisting of a alkylene group, a fluorine-substituted alkylene group, $-\text{O}-$, $-\text{S}-$, $-\text{CO}-$, $-\text{NR}-$, $-\text{SO}_2-$, and a combination thereof, and R is hydrogen or an alkyl group having 1 to 30 carbon atoms (Abstract; column 2, line 60 through column 4, line 14; column 17, line 1 through column 20, line 54); (4) wherein n is an integer of 3 to 9 (Abstract; column 2, line 60 through column 4, line 14; column 17, line 1 through column 20, line 54); (5) wherein Bl is an n-valent group comprising at least three rings (Abstract; column 2, line 60 through column 4,

Art Unit: 1712

line 14; column 17, line 1 through column 20, line 54); (17) wherein the liquid crystal molecules are discotic liquid crystal molecules (column 2, line 60 through column 4, line 14); and (19) wherein the liquid crystal molecules have polymerizable groups (column 10, lines 52-65).

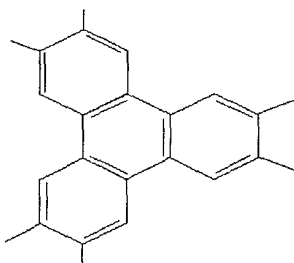
8. Claim 6 is rejected under 35 U.S.C. 102(e) as being anticipated by Matsuoka et al. (US Pat. No. 6,245,398) and Kawata et al. (US Pat. No. 6,338,808).

The applied references have a common assignee with the instant application; however, both references have a different inventive entity than the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Normally, only one reference is used in making a rejection under 35 U.S.C. 102; however, a 35 U.S.C. 102 rejection over multiple references has been held to be proper when the extra reference is cited to: (A) prove the primary reference contains an "enabled disclosure;" (B) explain the meaning of a term used in the primary reference; or (C) *show that a characteristic not disclosed in the reference is inherent* – see MPEP 2131.01. In the instant case, Kawata et al. is used to show that the n-valent group having at least two rings in Matsuoka et al. is *inherently* a group showing an excluded volume effect.

Regarding claim 6, Matsuoka et al. disclose an alignment promoter having the following n-valent cyclic group:

Art Unit: 1712



; however, they fail to explicitly disclose that it *shows an excluding volume effect*.

Kawata et al. disclose a similar invention, wherein the alignment promoter contains a bulky group (Bu) showing an excluded volume effect. Example Bu-6 (column 6, lines 1-13) has the same n-valent cyclic group as the alignment promoter in Matsuoka et al; therefore, the n-valent group in Matsuoka et al. would have inherently *shown an excluding volume effect*. Hence, the limitation is anticipated.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al. (US Pat. No. 6,245,398) in view of Kawata et al. (US Pat. No. 6,338,808).

Regarding claims 20-22, Matsuoka et al. disclose **(20)** an optically anisotropic element which comprises a liquid crystal layer comprising liquid crystal molecules and an orientation layer provided on one side of the liquid crystal layer (column 5, lines 7-13), wherein the liquid crystal layer further contains an alignment promoter represented by formula (I):



Art Unit: 1712

in which Hb is a hydrophobic group selected from the group consisting of an aliphatic group having 4 to 40 carbon atoms, an aromatic group having 6 to 40 carbon atoms, and an aliphatic substituted oligosiloxanoxy group having 1 to 40 carbon atoms; L^1 is a single bond or a divalent linking group; n is an integer of 2 to 12; and Bl is an n-valent group comprising at least two rings (Abstract; column 2, line 60 through column 4, line 14; column 17, line 1 through column 20, line 54); **(21)** wherein the liquid crystal molecules are aligned at an average inclined angle of 50° to 90° (column 10, lines 29-41); **(22)** and wherein the liquid crystal molecules are aligned and polymerized while keeping alignment (column 10, lines 29-41).

Matsuoka et al. disclose that the alignment promoter is, "used in an amount of 0.01 to 25 wt%, more preferably 0.1 to 10 wt% based on the amount of the incorporated discotic liquid crystal molecules;" (column 20, lines 58-62) however, they do not explicitly disclose that it is used in an amount of 0.005 to 0.5 g/m².

Kawata et al. disclose a similar optically anisotropic element (column 33, line 63 through column 35, line 23) that can be produced by applying a liquid crystal composition onto an orientation layer to form a liquid crystal layer, wherein the liquid crystal composition comprises discotic or rod-like liquid crystal molecules and an alignment promoter (column 15, lines 1-6). The alignment promoter is used in the liquid crystal composition in an amount of 0.01 to 20 wt%, and preferably in the range of 0.01 to 5 wt% based on the amount of the liquid crystal molecules (column 15, lines 7-9), and the amount of the alignment promoter in the liquid crystal layer is preferably in the range of 0.005 to 0.5 g/m².

Kawata et al. differs from Matsuoka et al. in that the alignment promoter has a slightly different structure: $(Hb)_m L(-Bu)_n$, wherein Hb is a hydrophobic group and Bu is an n-valent

Art Unit: 1712

bulky group having at least two rings. Instead of L being a reoccurring single bond or divalent group, L is a (m+n) valent linking group occurring only once in the structure, wherein each of m and n is independently an integer of 1 to 12.

As in Matsuoka et al., the alignment promoter of Kawata et al. is used in combination with liquid crystal molecules to provide an essentially vertical alignment at an averaged inclined angle in the range of 50° to 90°C. The alignment is controlled by the presence of and the concentration of the alignment promoter at the free interface (having no adjacent orientation layer) when only one orientation layer is provided in the optically anisotropic element. The rigid nature of the bulky group in the alignment promoter of each reference plays an integral role in aligning the liquid crystal molecules by exhibiting an excluded volume effect. Where the same bulky groups and wt% of alignment promoter (with respect to liquid crystal molecules) are used in each reference, it would have been obvious to use a similar coating weight of the alignment promoter (and bulky groups) to produce the same overall alignment effect.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the alignment promoter in an amount of 0.005 to 0.5 g/m², as taught by Kawata et al., in the optically anisotropic element of Matsuoka et al. because Kawata et al. disclose an analogous anisotropic layer featuring a liquid crystal composition having a combination of liquid crystal molecules and alignment promoter, wherein alignment of the liquid crystal molecules is controlled by the alignment promoter at the free interface when only one orientation layer is provided, resulting is an essentially vertical alignment at an averaged inclined angle in the range of 50° to 90°C.

Art Unit: 1712

Allowable Subject Matter

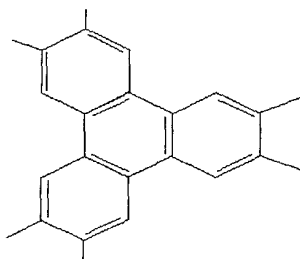
11. Claims 7-16 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 7-13: The closest prior art is Matsuoka et al. and Kawata et al.; however, they fail to teach or suggest (7) an embodiment wherein B1 is represented by $(-Cy^1-L^2-)_nCy^2$, yielding an overall formula of the alignment promoter represented by $(Hb-L^1-Cy^1-L^2-)_nCy^2$. Matsuoka et al. disclose only one embodiment for B1. Kawata et al. teach a similar alignment promoter; however, the linking group, which corresponds to L^1 of the instant invention, only occurs once in the overall formula. In the instant invention, there are 2 to 12 L^1 's.

Claims 8-13 would be allowable because they depend from claim 7.

Regarding claims 14-16: The closest prior art is Matsuoka et al.; however, they fail to teach or suggest the use of an alignment promoter, wherein B1 contains a photosensitive group. Matsuoka only teach the following B1 group:



Claims 15 and 16 would be allowable because they depend from claim 14.

Regarding claim 18: The closest prior art is Matsuoka et al. They teach a composition comprising the alignment promoter set forth in claim 1 and discotic liquid crystal molecule;

Art Unit: 1712

however, they fail to teach or suggest using this specific alignment promoter in combination with rod-like liquid crystal molecules.

Conclusion

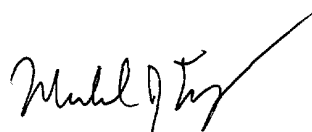
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Aminaka et al. (US Pat. No. 6,485,798) disclose a liquid crystal composition comprising the same alignment promoter set forth in Kawata et al.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on 703-308-2340. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Michael J. Feely
Patent Examiner
Art Unit 1712

October 1, 2003